

## 5-5

## Study Guide and Intervention

## Writing Equations in Point-Slope Form

## Point-Slope Form

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$y - y_1 = m(x - x_1)$ , where  $(x_1, y_1)$  is a given point on a nonvertical line and  $m$  is the slope of the line

## Example 1

Write the point-slope form of an equation for a line that passes through  $(6, 1)$  and has a slope of  $-\frac{5}{2}$ .

$$y - y_1 = m(x - x_1) \quad \text{Point-slope form}$$

$$y - 1 = -\frac{5}{2}(x - 6) \quad m = -\frac{5}{2}; (x_1, y_1) = (6, 1)$$

Therefore, the equation is  $y - 1 = -\frac{5}{2}(x - 6)$ .

## Example 2

Write the point-slope form of an equation for a horizontal line that passes through  $(4, -1)$ .

$$y - y_1 = m(x - x_1) \quad \text{Point-slope form}$$

$$y - (-1) = 0(x - 4) \quad m = 0; (x_1, y_1) = (4, -1)$$

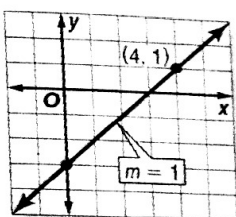
$$y + 1 = 0 \quad \text{Simplify.}$$

Therefore, the equation is  $y + 1 = 0$ .

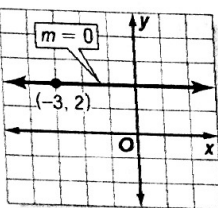
## Exercises

Write the point-slope form of an equation for a line that passes through each point with the given slope.

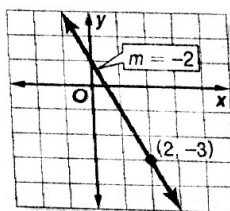
1.



2.



3.



4.  $(2, 1), m = 4$

5.  $(-7, 2), m = 6$

6.  $(8, 3), m = 1$

7.  $(-6, 7), m = 0$

8.  $(4, 9), m = \frac{3}{4}$

9.  $(-4, -5), m = -\frac{1}{2}$

10. Write the point-slope form of an equation for the horizontal line that passes through  $(4, -2)$ .

11. Write the point-slope form of an equation for the horizontal line that passes through  $(-5, 6)$ .

12. Write the point-slope form of an equation for the horizontal line that passes through  $(5, 0)$ .